

WHAT IS CLAIMED IS:

1. An AlGaAs-based ridge-stripe semiconductor laser element comprising an upper AlGaAs-base cladding layer and a lower AlGaAs-base cladding layer placing an active layer
5 in between, wherein
each of said upper AlGaAs-base cladding layer and said lower AlGaAs-base cladding layer further comprises two or more cladding layers including an AlGaAs-base first cladding layer close to said active layer, and an AlGaAs-base second
10 cladding layer disposed outward on said AlGaAs-base first cladding layer relative to said active layer and having a larger Al compositional ratio and a smaller refractive index than said AlGaAs-base first cladding layer.
- 15 2. The semiconductor laser element as claimed in Claim 1, wherein said first cladding layer and said second cladding layer are formed as an $\text{Al}_x\text{Ga}_{1-x}\text{As}$ ($0 < x < 1$) layer and an $\text{Al}_y\text{Ga}_{1-y}\text{As}$ ($0 < y < 1$) layer, respectively, where $x < y$.
- 20 3. An AlGaAs-based ridge-stripe semiconductor laser element having a stacked structure formed on a GaAs substrate, said stacked structure comprising:
an $\text{Al}_y\text{Ga}_{1-y}\text{As}$ ($0 < y < 1$) cladding layer having a same conductivity type as said substrate, an $\text{Al}_x\text{Ga}_{1-x}\text{As}$ ($0 < x < 1$)
25 cladding layer having a same conductivity type as said substrate, a non-doped active layer section, an $\text{Al}_x\text{Ga}_{1-x}\text{As}$ ($0 < x < 1$) first cladding layer having a conductivity type opposite to said substrate, an $\text{Al}_z\text{Ga}_{1-z}\text{As}$ ($0 < z \leq 1$) etching stop layer, an $\text{Al}_x\text{Ga}_{1-x}\text{As}$ ($0 < x < 1$) second cladding layer having a
30 conductivity type opposite to said substrate, an $\text{Al}_y\text{Ga}_{1-y}\text{As}$ ($0 < y < 1$) third cladding layer having a conductivity type

opposite to said substrate, and a GaAs contact layer having a conductivity type opposite to said substrate; wherein

said second cladding layer, said third cladding layer and said contact layer are formed as a stripe-patterned ridge;

5 and

an Al compositional ratio "z" of said etching stop layer, an Al compositional ratio "x" of said first cladding layer and said second cladding layer, and an Al compositional ratio "y" of said third cladding layer satisfy the relations $x < z$ and $x < y$, where a difference between "x" and "z" is set to 0.025 or more.

4. The semiconductor laser element as claimed in Claim 3, wherein said etching stop layer has a thickness between 0.015 μm and 0.02 μm .

5. A method of fabricating An AlGaAs-based ridge-stripe semiconductor laser element comprising the steps of:

forming a stacked structure on an active layer section, said stacked structure comprising an $\text{Al}_x\text{Ga}_{1-x}\text{As}$ ($0 < x < 1$) first cladding layer, an $\text{Al}_z\text{Ga}_{1-z}\text{As}$ ($0 < z \leq 1$) etching stop layer, an $\text{Al}_x\text{Ga}_{1-x}\text{As}$ ($0 < x < 1$) second cladding layer, an $\text{Al}_y\text{Ga}_{1-y}\text{As}$ ($0 < y < 1$) third cladding layer, and a GaAs contact layer; and having Al compositional ratio "z" of said etching stop layer, Al compositional ratio "x" of said first cladding layer and said second cladding layer, and Al compositional ratio "y" of said third cladding layer satisfying the relations $x < z$ and $x < y$, where a difference between "x" and "z" is set to 0.025 or more; and

forming a stripe-patterned ridge by wet-etching said contact layer, said third cladding layer and said second

cladding layer; wherein

said ridge forming step further comprises:

5 a first etching step of wet-etching part of said contact layer, said third cladding layer, and said second cladding layer; and

10 a second etching step of etching the residual portion of said second cladding layer up to said etching stop layer, by using an etchant comprising a mixed solution of an aqueous citric acid solution and an aqueous hydrogen peroxide solution.

6. The method of fabricating a semiconductor laser element as claimed in Claim 5, further comprising a step of cleaning said stacked structure etched in said first etching step using
15 an aqueous citric acid solution, between said first etching step and said second etching step.

7. The method of fabricating a semiconductor laser element as claimed in Claim 6, wherein said stacked structure etched
20 in said first etching step is transferred from said first etching step through said cleaning step to said second etching step without exposure to air and water.